Sequoia and Kings Canyon National Parks
Air related monitoring and research

Location	Program - or – Principal Investigator	Parameters/Frequency	Period of Record
		DEPOSITION	
		-- Wet Deposition	
Lower Kaweah	NADP	precipitation chemistry	1980 – present
Lower Kaweah	CARB	precipitation chemistry	1983 – 19
Ash Mountain	CARB	precipitation chemistry	1983 – present
Emerald Lake/ Groundhog Meadow	UCSB / CARB Melack/Sickman	precipitation chemistry	1990-1995
Lower Kaweah / Middle Fork drainage	Cal Tech / CARB Collett/ Daube	fog / cloudwater chemistry	
Lower Kaweah	USFS	nitrogen deposition	1999 – 2000
Ash Mountain Lower Kaweah	UC Davis Jack Zabik / Jim Seiber	pesticides	1990-1991
Ash Mountain Lower Kaweah	UC Davis Linda Aston / Jim Seiber	pesticides	1994
Ash Mountain Lower Kaweah Wolverton	UN Reno James LeNoir / Jim Seiber	pesticides	1997
		-- Dry Deposition	
Lookout Point	CASTNet		1997 – present
Wolverton	NOAA	NOX / SOX	1986 – 1999
Lower Kaweah	CARB/DRI CADMP	PM 10 and 2.5	1988 – 1995
Middle Fork of the Kaweah	USFS / UCR Byntnerowicz	passive nitrogen	1999 – present (seasonal)
Lower Kaweah	CARB / SEKI	total suspended particulates HI-Vol	1982 – 1987
Ash Mountain	CARB / SEKI	total suspended particulates HI-Vol	1982 – 1987
		OZONE	
Ash Mountain		continuous	1982 – present
Lookout Point		continuous	1988 – present
Lower Kaweah		continuous	1982 – present
Grant Grove		continuous	1990 – 1995

Cedar Grove		passive	2000 – present
Mineral King		passive	2000 – present
Misc.Backcountry		passive	1998 – 1999
		VISIBILITY	
Ash Mountain	IMPROVE	fine particulate matter	1992 – present
Lower Kaweah	NPS – Visibility	repeat photography	1983 – 1999
		SNOW	
29 sites throughout SEKI	CA Water Resources	snow water content sensors/surveys	
Emerald Lake Tokopah watershed	UCSB / CARB Dozier et.al.	snow dynamics	mid- 1980's
		LAKE AND STREAM CHEMISTRY	
Chamise Creek Tharps Creek Log Creek Emerald outflow	NPS / NAPAP	stream chemistry	1982 – 2000
Emerald Lake Pear Lake Topaz Lake Tokopah	UCSB / CARB / EOS Melack et.al.	stream chemistry	1983 – present
SEKI	Western Lake Survey	lake chemistry	1985
SEKI	USGS/WRD – Clow	lake chemistry	1999
Traugers Creek Deadwood Creek East Fork	NPS -	stream chemistry	1997 – present
6 backcountry lakes in SEKI	EPA/NPS Bradford/Heithmar	lake chemistry	present
		HYDROLOGY	
Elk Creek Log/Tharps Creek Emerald Outflow	NAPAP / NPS	discharge	1982 – 1999
Emerald outflow Pear outflow Topaz outflow Marble Fork	CARB / UCSB	discharge	1983 – present
Traugers Creek Deadwood Creek	USGS/BRD NPS	discharge	1997 – present
Kaweah watershed	SCE	discharge	early 1900's – present
		PALEOLIMNOLOGY	

SEKI backcountry lakes	Indiana University Whiting, Whitehead	paleolimnology	1987 – 1988
Emerald Lake	UCSB Holmes et.al.	diatom assemblages	1984 – 1985
		METEOROLOGY & TRANSPORT	
Elk Creek Giant Forest	NPS	weather stations – hourly	1984 – 1999
Lookout Point	NPS / CASTNet	weather station – hourly	1997 – present
Wolverton	NOAA	weather station – hourly	1986 – 1998
Middle Fork of the Kaweah river	Cal Tech / CARB Shair	tracer studies	1985
Middle Fork of the Kaweah river	UC Davis / CARB Ewell,Cahill,Flocchini	transport studies	1985 - 1986
Emerald Lake	EOS / UCSB	weather station – hourly	1984 – present
Topaz Lake	EOS / UCSB	weather station - hourly	1996 - present
Atwell Mill	Corps of Engineers		1975 – present
Ash Mountain Giant Forest Lodgepole Grant Grove	NPS / NOAA	temperature –daily highs/lows total precipitation	1928 – present
Cedar Grove Sugar Loaf Rattlesnake Wolverton helispot	RAWS	weather and fuel sticks	~ 1992 – present seasonal or year-round
		SOILS	
Middle Fork of the Kaweah River	UCD / CARB Huntington, Akeson, Burau, Whittig	ultra-detailed soil maps of the Middle Fork of the Kaweah River	1988
Giant Forest	Stanford/NPS Chorover/Vitousek	throughfall and soil solution chemistry	1988 – 1992
Emerald Lake watershed	UCR / CARB Brown, Lund, Lueking	soil solution chemistry nutrient cycling	
		UV	
Ash Mountain	PRIMENet	UV	1998 – present

RELATED REFERENCES:

Aston, L.S. and J.N. Seiber (1997). Fate of summertime airborne organophosphate pesticide residues in the Sierra Nevada mountains. J.Environ.Qual. 26:1483-1492.

Cory,L., P.Fjeld and W.Serat (1970) Distribution patterns of DDT residues in the Sierra Nevada Mountains. Pesticide Monitoring J. 3:204-211.

Davidson, Carlos, H.B. Shaffer, and Mark Jennings (2000) Declines of the California Red-Legged frog: climate, UV-B, habitat, and pesticides hypotheses. Ecol. Applications 11(2) pp. 464-479.

Datta, S., L.L. McConnell, J.E. Baker, J.S. LeNoir and J.N. Seiber (1998a). Evidence for atmospheric transport and deposition of polychlorinated biphenyls to the Lake Tahoe Basin, California-Nevada. Environ. Sci. Technol. 32:1378-1385.

Datta, S., L. Hansen, L.L. McConnell, J.E. Baker, J.S. LeNoir and J.N. Seiber (1998b). Pesticides and PCB contaminants in fish and tadpoles from the Kaweah River basin, California. Bull. Environ. Contam. Toxicol. 60:829-836.

Koracin, D., V.Isakov and J. Frye (1998a). A Lagrangian particle dispersion model (LAP) applied to transport and dispersion of chemical tracers in complex terrain. Presented at the Tenth Joint Conference on the Applications of Air Pollution Meteorology, Phoenix, AZ, 11-16 January 1998. Paper 5B.5, 227-230.

LeNoir, J.S., L.L. McConnell, G.M.Fellers, T.H. Cahill and J.N. Seiber (1999). Summertime transport of current-use pesticides from California's Central Valley to the Sierra Nevada mountain range. Environ. Toxicol. and Chem. 18(12):2715-2722.

McConnell, L.L., J.S. LeNoir, S. Datta and J.N. Seiber (1998). Wet deposition of current-use pesticides in the Sierra Nevada Mountain Range, California, USA. Environ. Toxicol. Chem., (in press??).

Seiber, J.N., B.W. Wilson and M.M. McChesney (1993). Air and fog deposition residues of four organophosphate insecticides used on dormant orchards in the San Joaquin Valley, California. Environ. Sci. Technol. 27:2236-2243.

Shair, F.H. (1987). Atmospheric tracer experiments aimed at characterizing upslope/downslope flows along the southwestern region of the Sierra Nevada mountains. Calif. Air Resources Board Report. Agreement A4-126-32.

Zabik, J.M. and J.N. Seiber (1993). Atmospheric transport of organophosphate pesticides from California's Central Valley to the Sierra Nevada mountains. J. Environ. Qual. 22:80-90.

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QUESTIONS/OBJECTIVES (Sierra Nevada mountains):

-- determine whether there is an association between contaminant distribution and the decline/extinctions of amphibian populations

-- determine concentrations of known or potential environmental endocrine disruptors and related chemicals

-- assemble GIS and other landscape scale meteorological descriptions of key elements of the Sierra Nevada mountains, overlaid with the concentrations of organic contaminants in water

-- expand toxicology test of tadpoles with individual chemicals and mixtures

-- correlate known or extrapolated landscape-scale contamination patterns and chemical toxicity data with known or expected amphibian populations

-- determination of origins of pesticides, toxics, etc. – regional or global?

-- describe temporal and spatial patterns of distribution of the most used chemicals in the San Joaquin Valley

-- identify the topographic and spatial attributes of the landscape that influence contaminant distribution – valley flows, transport in a complex terrain

-- identify easy, inexpensive methodology for long term monitoring (precipitation, vegetation, surface water, resin samplers)

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